

2.1 Air Pollution Predictions for 2005

2.1.1 The predictions for NO₂ and PM10 have been based on different years. The choice of year is dependent upon the pollutant and its NAQS objective. Each year represents the 'worst case' scenario for each pollutant in recent times. These scenarios are the result of an analysis of the measurement data of the LAQN and are summarised in the bullet points below. A complete description of current air quality is given in the next section.

- **Met. Year 1996** represents the 'worst case' for the prediction of both the existing and proposed NAQS objective for PM10;
- **Met. Year 1997** represents the 'worst case' for the prediction of annual average concentration of NO₂;
- **December 1991** represents the period where the highest hourly concentration of NO₂ was recorded, in the UK.

2.1.2 By way of comparison, the predictions of PM10 for 1997 and NO₂ for 1996 have also been included. They represent a more 'typical year' for pollution concentrations and are also summarised in this chapter.

2.1.3 A complete description of the modelling methodologies and the assumptions made is given in appendices 1 and 2.

2.2 The Review and Assessment Stage 3 Predictions for PM10

2.2.1 Introduction

2.2.2 The EC Daughter Directive Stage 1 Limit value is proposed as the new PM10 objective in the current revision of the NAQS. The existing objective for PM10 has been retained here for indicative purposes only. The NAQS objectives are summarised in Table 2.1 below.

Table 2.1 The NAQS Existing and Proposed Objectives

Pollutant	Existing NAQS Objective	Proposed NAQS Objective
To be achieved by 2005		
NO ₂	21 ppb annual mean 150 ppb, averaged over one hour	By end 2005 21 ppb annual mean 105 ppb, averaged over 1 hour (max. 18 exceedences)
PM10	50 µg/m ³ , as 99 th percentile of maximum 24 hour running means	By end 2004 50 µg/m ³ , as 24 hour means not to be exceeded 35 times/annum ¹

ppb = parts per billion, µg/m³ = micrograms per cubic metre

¹ Gravimetric measurements, to be achieved by the end of 2004

2.2.3 The Daughter Directive for PM10

2.2.4 The Daughter Directive is predicted to be difficult to meet along major roads, but will be met at background locations. For the purposes of this document, exceedence at background locations occurs when the concentration over an entire 1km² area is above the objective. Background locations are defined as areas more than 50m from a major road, and some roads exceed beyond 50m i.e. "at background". In the LB Richmond upon Thames the model predictions are that the objective will be exceeded along the main traffic routes in the Borough. These include the following

major roads, the A316 Chertsey Road/Twickenham Road, the A306 Hammersmith Bridge/Roehampton Lane and the A205 Mortlake Road/Clifford Avenue.

2.2.5 Map 2.1 shows the location of the areas of exceedence in the Borough. Table 2.3 and Table 2.4 identify each specific road link, which fails to meet the objective. The final column gives the predicted distance from the kerb at which concentrations of PM10 will meet the Daughter Directive objective at the end of 2004. Table 2.5 and Table 2.6 gives the same details based on 1997.

2.2.6 The NAQS PM10 Objective

2.2.7 The current NAQS PM10 objective is being replaced by the Daughter Directive, but has been retained here as an indicator of future particle concentrations. Map 2.2 summarises the predicted concentration of the current PM10 objective in 2005. This indicates that the whole of greater London including the LB Richmond upon Thames will exceed the objective of 50 µg/m³. The range of concentrations of PM10 is between 58 and 68 µg/m³ (99th percentile of max rolling 24 hour means) in 2005.

2.3 The Review and Assessment Stage 3 Predictions for Nitrogen Dioxide (NO₂)

2.3.1 Annual Average NO₂ Objective

2.3.2 The annual average NO₂ objective is predicted to be difficult to meet along major roads, but will be met at background locations. In LB Richmond upon Thames the predictions are that the objective is exceeded along the main traffic routes in the borough. These are the the A316 Chertsey Road/Twickenham Road, the A306 Hammersmith Bridge/Roehampton Lane and the A205 Mortlake Road/Clifford Avenue.

2.3.3 Map 2.3 shows the location of the areas of exceedence in the Borough.

2.3.4 Table 2.9 and Table 2.10 identify each road link, which fails to meet the objective based on 1997 Met. Year. The final column gives the distance from the kerb at which concentrations of NO₂ will meet the NAQS objective. Table 2.7 and Table 2.8 gives the same details based on the 1996 Met. Year.

2.3.5 Peak Hour NO₂ Objective

2.3.6 Through an analysis of the December 1991 winter episode it has been shown that at roadside and background sites in central London, the highest hourly concentration of NO₂ is not predicted to exceed the NAQS objective in 2005. However because of the uncertainty in the analysis of this objective and the proximity of the Bridge Place prediction to 150 ppb (see Table 2.2), it must be considered possible to exceed this objective in central London only. This is therefore considered very unlikely in the London Borough of Richmond upon Thames.

Table 2.2 Predicted Highest Hourly NO₂ in London in 1991 and 2005

	Measured Concentration 1991	Predicted Concentration 2005
Bridge Place	418	139
Cromwell Road	334	90
West London	369	117

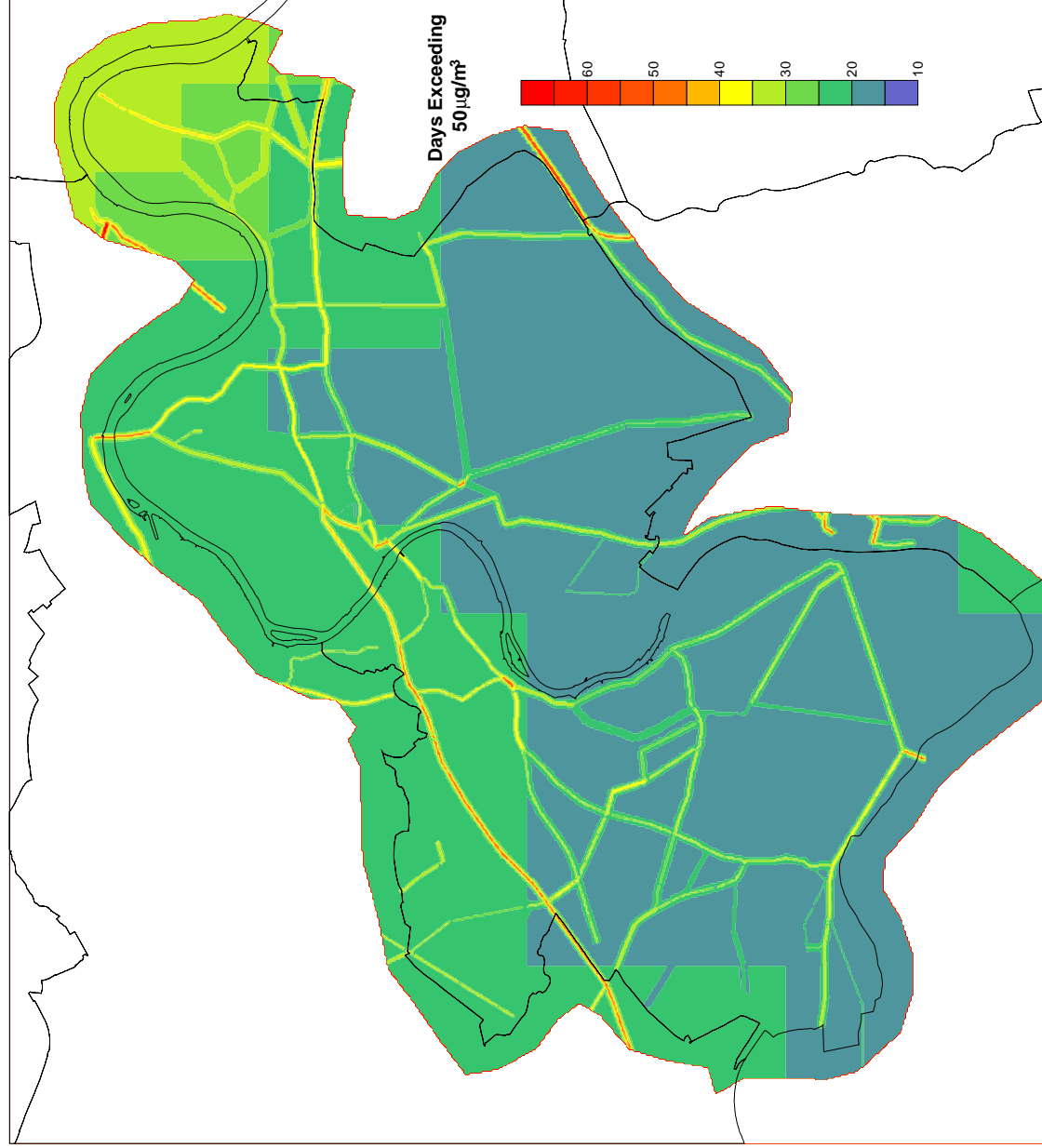
N.B. The following maps show pollution concentrations at both background and roadside locations. Some degree of caution must be exercised when interpreting these however, as the highest pollution concentrations are shown to be in the centre of the roads, where exposure to the public will be small.

The tables of results present some information to a higher precision than can be justified from the data and methods used. This has been done for comparison purposes only.

Certain sections of roads cannot be shown on the following maps. This has occurred where complete rotating census data for these road sections is not available and these have therefore been omitted.

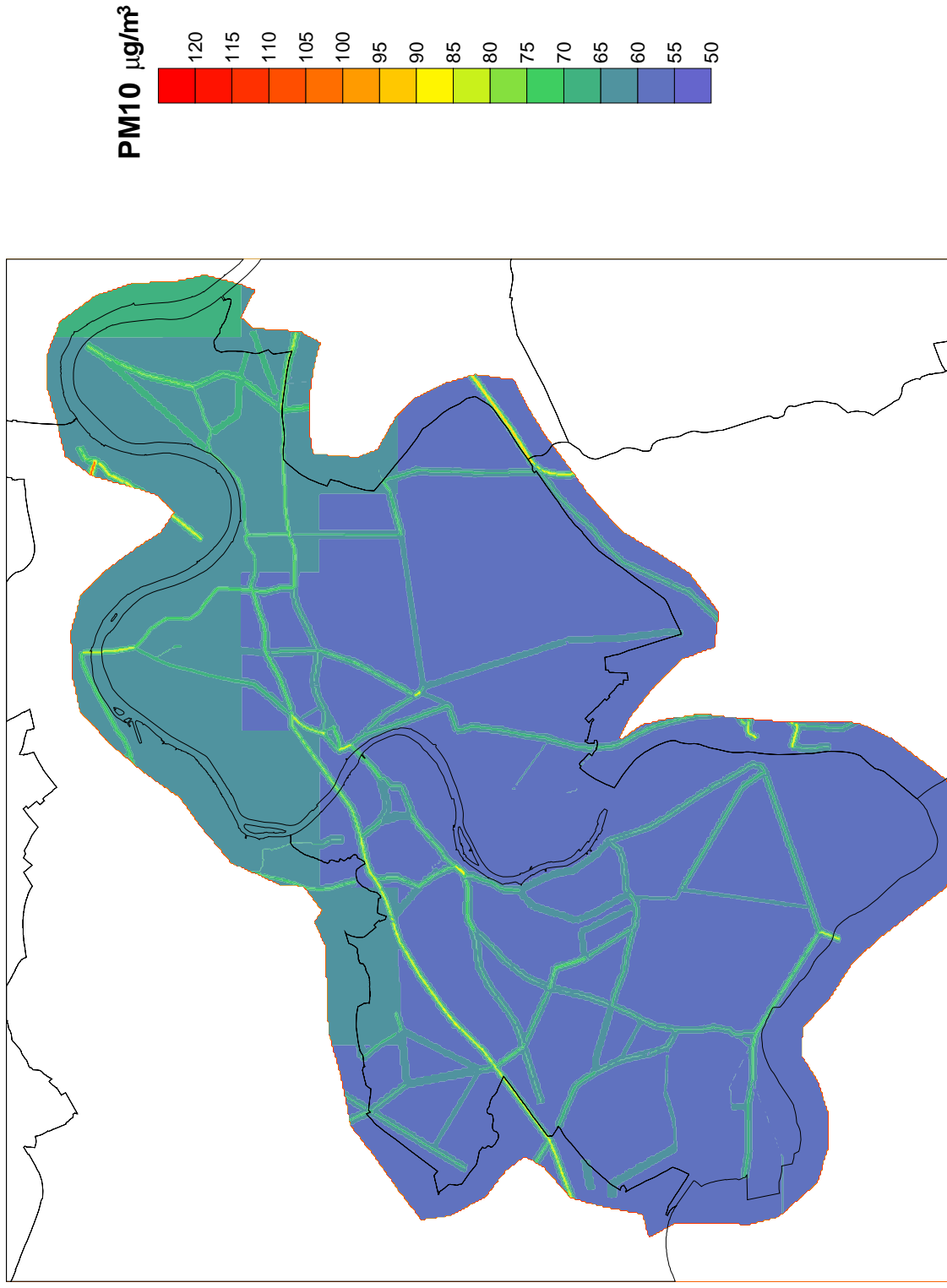
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Map 2.1 Predictions of the Daughter Directive PM10 Objective for the London Borough of Richmond upon Thames for 2004 based on 1996 Met. Year



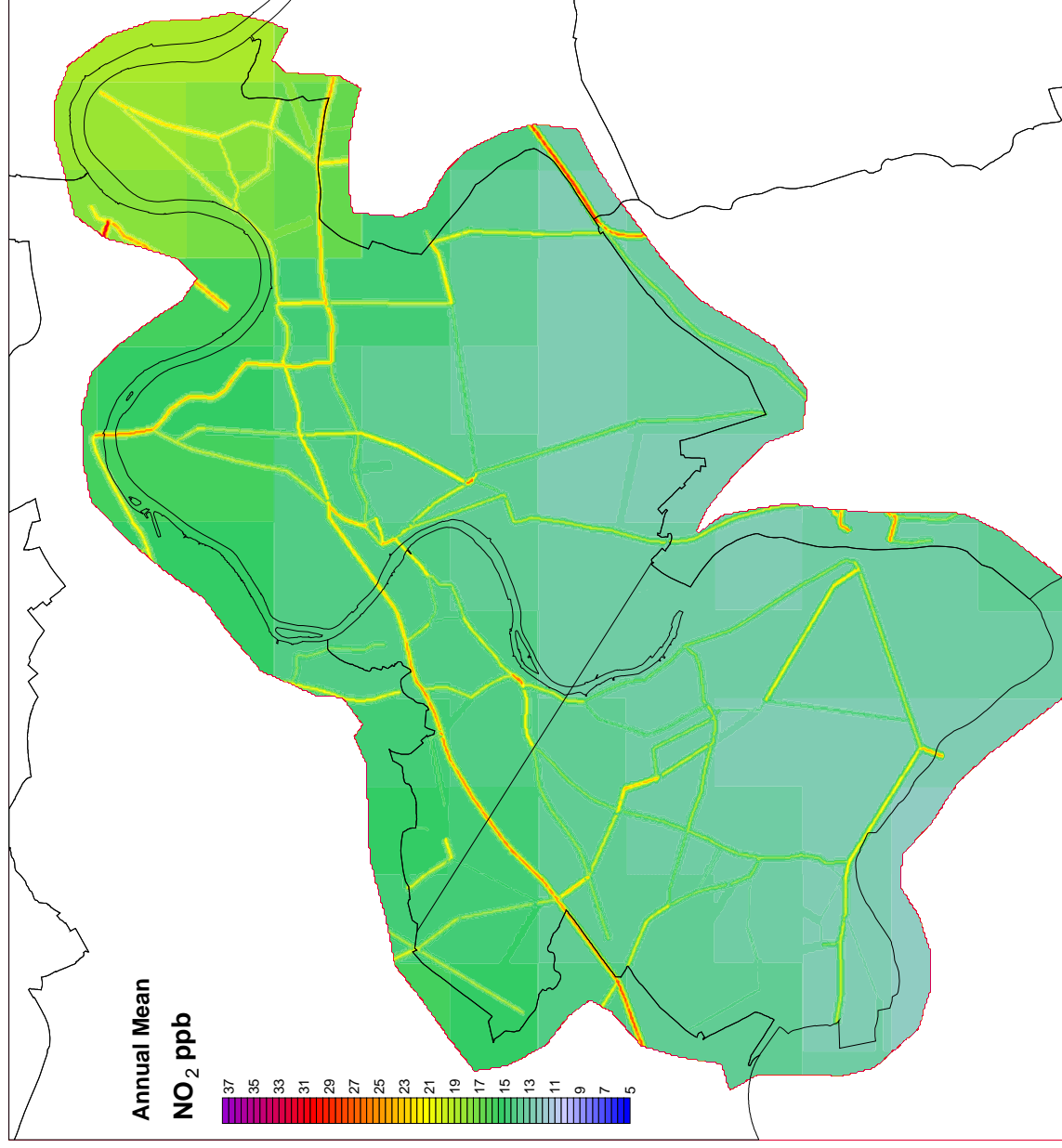
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Map 2.2 Predictions of the Existing NAQS PM10 Objective for the London Borough of Richmond upon Thames for 2005 based on 1996 Met. Year



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Map 2.3 Predictions of the Nitrogen Dioxide NO₂ Objective for the London Borough of Richmond upon Thames for 2005 based on 1997 Met. Year



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Table 2.3 LTS Roads Predicted to Exceed the Daughter Directive for PM10 in 2004 based on 1996 Met. Year

Junction Description A	Junction Description B	Road number	Distance (m) from the kerb at which the Daughter Directive is met
SIXTH CROSS RD/STAINES RD	HOSPITAL BRIDGE RD/CHERTSEY RD W	B358	3.2
ROEHAMPTON GATE/PRIORY LA	SAWYER'S HILL/*BDY WANDSWORTH	unclassified	4.2
SOUTH RD/HAMPTON RD/WELLINGTON R	SOUTH RD/STANLEY RD	B358	2.2
SOUTH RD/STANLEY RD	STANLEY RD/FULWELL RD/SHACKLEGAT	B358	4.2
RICHMOND HILL/STAR AND GARTER HI	STAR AND GARTER HILL/RICHMOND GA	B353	9.2
UPPER RICHMOND RD WEST/SHEEN LA	SHEEN LA/LOWER RICHMOND RD	B351	4.2

Table 2.4 Rotating Census Roads Predicted to Exceed the Daughter Directive for PM10 in 2004 based on 1996 Met. Year

Road Name	Road Number	Distance (m) from the kerb at which the Daughter Directive is met
KEW ROAD	A205	9.2
RICHMOND ROAD	A305	2.2
YORK STREET	A305	2.2
GEORGE STREET	A305	1.2
HILL STREET	A305	1.2
THAMES STREET	A308	4.2
UPPER RICHMOND ROAD	A205	6.2
UPPER RICHMOND ROAD WEST	A205	6.2
HEATH ROAD	A305	4.2
THE GREEN	A305	4.2
LONDON ROAD	A310	2.2
CHERTSEY ROAD	A316	9.2
MORTLAKE ROAD	A205	4.2
CASTELNAU	A306	14.2
HAMMERSMITH BRIDGE ROAD	A306	14.2
KEW ROAD	A307	9.2
THE QUADRANT	A307	9.2
HAMPTON COURT WAY	A309	9.2
UPPER RICHMOND ROAD	A205	14.2
ROEHAMPTON LANE	A306	9.2
LOWER RICHMOND ROAD	A316	4.2
BRIDGE STREET	A305	4.2
RICHMOND ROAD	A305	4.2
THE AVENUE	A316	5.2
TWICKENHAM ROAD	A316	5.2
CLIFFORD AVENUE	A205	4.2
ROCKS LANE	A306	4.2
KING STREET	A305	12.2
LOWER MORTLAKE ROAD	A316	4.2
LOWER RICHMOND ROAD	A316	4.2
CHERTSEY ROAD	A316	8.2
HAMPTON COURT ROAD	A308	2.2
GREAT CHERTSEY ROAD	A316	8.2

Table 2.5 LTS Roads Predicted to Exceed the Daughter Directive for PM10 in 2004 based on 1997 Met. Year

Junction Description A	Junction Description B	Road number	Distance (m) from the kerb at which the Daughter Directive is met
RICHMOND HILL/STAR AND GARTER HI	STAR AND GARTER HILL/RICHMOND GA	B353	2.2

Table 2.6 Rotating Census Roads Predicted to Exceed the Daughter Directive for PM10 in 2004 based on 1997 Met. Year

Road Name	Road Number	Distance (m) from the kerb at which the Daughter Directive is met
KEW ROAD	A205	2.2
CHERTSEY ROAD	A316	1.2
HAMPTON COURT WAY	A309	1.2
KING STREET	A305	3.2
CHERTSEY ROAD	A316	0.2
GREAT CHERTSEY ROAD	A316	0.2

Table 2.7 LTS Roads Predicted to Exceed the NAQS Annual Average NO₂ Objective based on 1996 Met. Year

Junction Description A	Junction Description B	Road_number	Distance (m) from the kerb at which the NAQS objective is met
SOUTH RD/ STANLEY RD	STANLEY RD/ FULWELL RD/ SHACKLEGAT	B358	1.2
RICHMOND HILL/ STAR AND GARTER HI	STAR AND GARTER HILL/ RICHMOND GA	B353	5.2

Table 2.8 Rotating Census Roads Predicted to Exceed the NAQS Annual Average NO₂ Objective based on 1996 Met. Year

Road Name	Road Number	Distance (m) from the kerb at which the NAQS objective is met
KEW ROAD	A205	4.2
UPPER RICHMOND ROAD	A205	0.2
UPPER RICHMOND ROAD WEST	A205	0.2
CHERTSEY ROAD	A316	2.2
MORTLAKE ROAD	A205	0.2
HAMPTON COURT WAY	A309	1.2
UPPER RICHMOND ROAD	A205	3.2
KING STREET	A305	4.2
CHERTSEY ROAD	A316	2.2
GREAT CHERTSEY ROAD	A316	2.2

Table 2.9 LTS Roads Predicted to Exceed the NAQS Annual Average NO₂ Objective based on 1997 Met. Year

Junction Description A	Junction Description B	Road_number	Distance (m) from the kerb at which the NAQS objective is met
SIXTH CROSS RD/STAINES RD	HOSPITAL BRIDGE RD/CHERTSEY RD W	B358	3.2
HIGH ST, WHITTON/NELSON RD/HOUNS	NELSON RD/WARREN RD	unclassified	1.2
HAMPTON COURT RD/CHURCH GROVE	PARK RD/CHURCH GROVE	B359	2.2
ROBIN HOOD ROUNDABOUT/ROBIN HOOD	EAST CARRIAGEWAY/ROBIN HOOD GATE	unclassified	0.2
ROEHAMPTON GATE/PRIORY LA	EAST CARRIAGEWAY/*BDY WANDSWORTH	unclassified	0.2
ROEHAMPTON GATE/PRIORY LA	SAWYER'S HILL/*BDY WANDSWORTH	unclassified	4.2
LOWER RICHMOND RD/MILL HILL RD	ROCKS LA/LOWER RICHMOND RD/MILL	B349	1.2
SAWYER'S HILL/*BDY WANDSWORTH	SAWYERS HILL	unclassified	2.2
SOUTH RD/HAMPTON RD/WELLINGTON R	SOUTH RD/STANLEY RD	B358	3.2
SOUTH RD/STANLEY RD	STANLEY RD/FULWELL RD/SHACKLEGAT	B358	5.2
STAR AND GARTER HILL/RICHMOND GA	RICHMOND GATE/SAWYER'S HILL	unclassified	0.2
RICHMOND HILL/STAR AND GARTER HI	MARCHMONT RD/QUEEN'S RD	B353	2.2
RICHMOND HILL/STAR AND GARTER HI	STAR AND GARTER HILL/RICHMOND GA	B353	10.2
UPPER RICHMOND RD WEST/SHEEN LA	SHEEN LA/LOWER RICHMOND RD	B351	4.2
SHEEN RD/MANOR RD/QUEEN'S RD	MARCHMONT RD/QUEEN'S RD	B353	3.2

Table 2.10 Rotating Census Roads Predicted to Exceed the NAQS Annual Average NO₂ Objective based on 1997 Met. Year

Road Name	Road Number	Distance (m) from the kerb at which the NAQS objective is met
KEW ROAD	A205	10.2
THAMES STREET	A308	1.2
UPPER RICHMOND ROAD	A205	6.2
UPPER RICHMOND ROAD WEST	A205	6.2
HEATH ROAD	A305	1.2
THE GREEN	A305	1.2
CHERTSEY ROAD	A316	7.2
MORTLAKE ROAD	A205	5.2
CASTELNAU	A306	5.2
HAMMERSMITH BRIDGE ROAD	A306	5.2
KEW ROAD	A307	4.2
THE QUADRANT	A307	4.2
HAMPTON COURT WAY	A309	5.2
UPPER RICHMOND ROAD	A205	10.2
ROEHAMPTON LANE	A306	5.2
LOWER RICHMOND ROAD	A316	1.2
BRIDGE STREET	A305	1.2
RICHMOND ROAD	A305	1.2
THE AVENUE	A316	3.2
TWICKENHAM ROAD	A316	3.2
CLIFFORD AVENUE	A205	4.2
KING STREET	A305	9.2
LOWER MORTLAKE ROAD	A316	2.2
LOWER RICHMOND ROAD	A316	2.2
CHERTSEY ROAD	A316	7.2
HAMPTON COURT ROAD	A308	0.2
GREAT CHERTSEY ROAD	A316	6.2